Title: Observed and synthetic spectra of binaries in the optical and ultraviolet region

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Abstract: Eclipsing binaries are still the most reliable source of accurate stellar masses and radii, because there is no need to use any calibrations. These stellar parameters are needed in various fields of astrophysics. Theoretical background regarding stellar spectra and binaries needed for successful completion of the practical part of the thesis are summarized in the first chapter. Description of the practical part of the thesis is given in the second and third chapter. Author acquired and reduced spectroscopic and photometric observations of the quadruple-star system ξ Tau and measured radial velocities of its components. She estimated masses and radii of those components and shapes of their orbits by modelling the light curve and radial-velocity curves. Apsidal motion of the outer orbit was newly discovered. The author has also developed a program, which interpolates in the grids of synthetic spectra and fits interpolated spectra to the observed ones with the least-square method. Parameters describing the synthetic spectra, which are fitted by the program, are: the effective temperature $T_{\rm eff}$, logarithm of the surface gravitational acceleration $\log g$, projected rational velocity $v_{\rm rot} \sin i$, relative luminosity $L_{\rm r}$ and the radial velocity RV. The author used the program to measure radial velocities of the components of ξ Tau and to derive their parameters listed above. The results of the diploma thesis will become a part of the planned study of the ξ Tau system by an international team of collaborators.

Keywords: multiple systems – orbital elements – spectra